

PATENT COOPERATION TREATY

BAKER BOTTS L.L.P.

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT 01 MAR 15 PM 12: 35

To: HENRY TANG
BAKER & BOTTS, LLP
30 ROCKEFELLER PLAZA
NEW YORK NY 10112-0228

TO ~~TO~~
WRITTEN OPINION

(PCT Rule 66)

Date of Mailing
(day/month/year)

07 MAR 2001

Applicant's or agent's file reference

32282-PCT

REPLY DUE

within TWO months
from the above date of mailing

International application No.

PCT/US99/26127

International filing date (day/month/year)

05 NOVEMBER 1999

Priority date (day/month/year)

06 NOVEMBER 1998

International Patent Classification (IPC) or both national classification and IPC
Please See Supplemental Sheet.

Applicant

THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Docketed

For 5 / 17 / 2001 By

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06 MARCH 2001

Name and mailing address of the IPEA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

Mehrdad Dastouri

Telephone No. (703) 305-2438

WRITTEN OPINION

International application No.

PCT/US99/26127

I. Basis of the opinion

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☒ the description:

pages 1-32 , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____

☒ the claims:

pages 33-44 , as originally filed
 pages NONE , as amended (together with any statement) under Article 19
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____

☒ the drawings:

pages 1-12 , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____

☒ the sequence listing part of the description:

pages NONE , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".

WRITTEN OPINION

International application No.

PCT/US99/26127

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. statement**

Novelty (N)	Claims	<u>NONE</u>	YES
	Claims	<u>1-64</u>	NO
Inventive Step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-64</u>	NO
Industrial Applicability (IA)	Claims	<u>1-64</u>	YES
	Claims	<u>NONE</u>	NO

2. citations and explanations

1. Claims 1-15, 20-34, 39-51, 56-61, 62/3, 62/4, 63/22, 63/23, 64/40 and 64/41 lack an inventive step under PCT Article 33(3) as being obvious over Dalziel et al (U.S. 5,579,444) in view of Nasar et al (U.S. 5,144,685).

Dalziel et al disclose a system for generating a description record from image information, comprising:

at least one image input interface for receiving said image information (Figure 2, Camera 12); a computer processor coupled to said at least one image input interface for receiving said image information therefrom, processing said image information by performing image object extraction processing to generate image object descriptions from said image information, processing said generated image object descriptions by object hierarchy construction and extraction processing to generate image object hierarchy descriptions (Figure 4; Column 12, Lines 1-25), and processing said generated image object descriptions by entity relation generation processing to generate entity relation descriptions, wherein at least one description record including said image object descriptions, said image object hierarchy descriptions and said entity relation descriptions is generated to represent content embedded within said image information (Figures 23 and 24; Column 39, Lines 64-67, Column 40, Lines 1-49. Object hierarchy description includes identifying oranges and apples, and color of the objects, i.e., red apples and green apples. Entity relation description identifies the relative position of the objects, i.e., object 1 is below object 2.); and a data storage system, operatively coupled to said processor, for storing said at least one description record. Dalziel et al do not explicitly disclose generating entity relation graph descriptions for the identified objects. Nasar et al disclose a landmark recognition system comprising generating entity relation graph descriptions (Figure 10; Column , Lines . The entity relation graph depicts positional relationship between the gate and the road in the landmark image of Figure 13.).

(Continued on Supplemental Sheet.)

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:

IPC(7): G06K 9/00, 9/34, 9/46, 9/56, 9/36, 9/60; G06F 3/00; G09C 5/00; H04N 7/12; G06F 7/00, 15/00. and US Cl.: 382/164, 165, 173, 181, 190, 195, 205, 232, 237, 304; 707/1, 3, 104, 514; 345/114, 328; 348/408; 706/55.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

Regarding Claim 2, Dalziel et al further disclose the system of claim 1, wherein said image object extraction processing and said object hierarchy construction and extraction processing are performed in parallel (Figure 4, Task parallel Processing; Column 12, Lines 5-19).

Regarding Claim 3, Dalziel et al further disclose the system of claim 1, wherein said image object extraction processing comprises: image segmentation processing to segment each image in said image information into regions within said image (Figure 2, Image Segmenter 14); and feature extraction and annotation processing to generate one or more feature descriptions for one or more said regions (Figure 2, Tracker, Sketcher, ranger 16a-16c, Recognizer 18; Column 10, Lines 58-67, Column 11, Lines 1-6); whereby said generated image object descriptions comprise said one or more feature descriptions for one or more said regions (Figure 16; Column 30, Lines 15-41).

Regarding Claim 4, Dalziel et al further disclose the system of claim 3, wherein said one or more feature descriptions are selected from the group consisting of media features, visual features, and semantic features (Column 30, Lines 15-41. Feature descriptor green is selected from visual features of the object.).

Regarding Claim 5, Dalziel et al further disclose the system of claim 4, wherein said semantic features are further defined by at least one feature description selected from the group consisting of who, what object, what action, where, when, why, code downloading, and text annotation (Figure 24; Column 40, Lines 5-8. The semantic feature for Object 1 is "what object".).

Regarding Claim 6, Dalziel et al further disclose the system of claim 4, wherein said visual features are further defined by at least one feature description selected from the group consisting of color, texture, position, size, shape, motion, code downloading, and orientation (Figure 24; Column 40, Lines 38-48. The visual feature for Objects 2 and 3 is "position". Object 2 is apart from Object 1 at points c and d.).

Regarding Claim 7, Dalziel et al further disclose the system of claim 4, wherein said media features are further defined by at least one feature description selected from the group consisting of file format, file size, color representation, resolution, data file location, author, creation, scalable layer, code downloading, and modality transcoding (Figure 16; Column 30, Lines 29-38. The media feature for Region A is "green".).

Regarding Claim 8, Dalziel et al further disclose the system of claim 1, wherein said object hierarchy construction and extraction processing generates image object hierarchy descriptions of said image object descriptions based on visual feature relationships of image objects represented by said image object descriptions (Figure 24; Column 40, Lines 38-48. The visual feature for Objects 2 and 3 is "position". Object 2 is apart from Object 1 at points c and d.).

Regarding Claim 9, Dalziel et al further disclose the system of claim 1, wherein said object hierarchy construction and extraction processing generates image object hierarchy descriptions of said image object descriptions based on semantic feature relationships of image objects represented by said image object descriptions (Figure 24; Column 40, Lines 5-8. The semantic feature for Object 1 is "what object".).

Regarding Claim 10, Dalziel et al further disclose the system of claim 1, wherein said object hierarchy construction and extraction processing generates image object hierarchy descriptions of said image object descriptions based on media

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

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feature relationships of image objects represented by said image object descriptions (Figure 16; Column 30, Lines 29-38. The media feature for Region A is "green").

Regarding Claim 11, arguments analogous to those presented for Claims 8-10 are applicable to Claim 11.

Regarding Claim 12, Dalziel et al further disclose the system of claim 1, wherein said object hierarchy construction and extraction processing generates image object hierarchy descriptions of said image object descriptions based on relationships of image objects represented by said image object descriptions, wherein said image object hierarchy descriptions have a plurality of hierarchical levels (Figures 24 and 26; Column 40, Lines 28-49).

Regarding Claim 13, Dalziel et al further disclose the system of claim 12, wherein said image object hierarchy descriptions having a plurality of hierarchical levels comprise clustering hierarchies (Figure 26; Column 42, Lines 28-43).

Regarding Claim 14, arguments analogous to those presented for Claims 8-10 are applicable to Claim 14.

Regarding Claim 15, Nasar et al further disclose the system of claim 1, wherein said entity relation graph generation processing generates entity relation graph descriptions of said image object descriptions based on relationships of image objects represented by said image object descriptions, wherein said relationships are selected from the group consisting of visual feature relationships, semantic feature relationships and media feature relationships (Figure 10; Column 8, Lines 50-68).

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

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With regards to Claims 20 and 39, arguments analogous to those presented for Claim 1 are applicable to Claims 20 and 39.

With regards to Claims 21 and 40, arguments analogous to those presented for Claim 2 are applicable to Claims 21 and 40.

With regards to Claim 22, arguments analogous to those presented for Claim 3 are applicable to Claim 22.

With regards to Claims 23 and 41, arguments analogous to those presented for Claim 4 are applicable to Claims 23 and 41.

With regards to Claims 24 and 42, arguments analogous to those presented for Claim 5 are applicable to Claims 24 and 42.

With regards to Claims 25 and 43, arguments analogous to those presented for Claim 6 are applicable to Claims 25 and 43.

With regards to Claims 26 and 44, arguments analogous to those presented for Claim 7 are applicable to Claims 26 and 44.

With regards to Claims 27 and 45, arguments analogous to those presented for Claim 8 are applicable to Claims 27 and 45.

With regards to Claims 28 and 46, arguments analogous to those presented for Claim 9 are applicable to Claims 28 and 46.

With regards to Claims 29 and 47, arguments analogous to those presented for Claim 10 are applicable to Claims 29 and 47.

With regards to Claim 30, arguments analogous to those presented for Claim 11 are applicable to Claim 30.

With regards to Claims 31 and 48, arguments analogous to those presented for Claim 12 are applicable to Claims 31 and 48.

With regards to Claims 32 and 49, arguments analogous to those presented for Claim 13 are applicable to Claims 32 and 49.

With regards to Claims 33 and 50, arguments analogous to those presented for Claim 14 are applicable to Claims 33 and 50.

With regards to Claims 34 and 51, arguments analogous to those presented for Claim 15 are applicable to Claims 34 and 51.

Regarding Claim 56, Dalziel et al further disclose the system of Claim 12, wherein said image object hierarchy descriptions having a plurality of hierarchical levels are configured to comprise multiple levels of abstraction hierarchies (Figure 26; Column 42, Lines 28-43).

With regards to Claims 57, 59 and 61, arguments analogous to those presented for Claim 11 are applicable to Claims 57, 59 and 61.

With regards to Claims 58 and 60, arguments analogous to those presented for Claim 56 are applicable to Claims 58 and 60.

regarding Claims 62/3 and 62/4, Nasar et al further disclose a landmark recognition system wherein one or more feature descriptions include pointers to extraction and matching code in order to facilitate code downloading (Figure 2; Column 6, Lines 3-14).

With regards to Claims 63/22 and 63/23, arguments analogous to those presented for Claim 62/3 and 62/4 are applicable to Claims 63/22 and 63/23.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

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With regards to Claims 64/40 and 64/41, arguments analogous to those presented for Claim 62/3 and 62/4 are applicable to Claims 64/40 and 64/41.

2. Claims 16-19, 35-38 and 52-55 lack an inventive step under PCT Article 33(3) as being obvious over Dalziel et al (U.S. 5,579,444) further in view of Nasar et al (U.S. 5,144,685) and Tuong Dao (An Indexing Model for Structured Documents to Support Queries on Content, Structure and Attributes, IEEE Paper ISBN: 0-8186-8464-X).

Regarding Claim 16, neither Dalziel et al nor Nasar et al disclose the system of claim 1, further comprising an encoder for receiving and encoding said image object descriptions into encoded description information. Tuong Dao disclose an indexing model for structured documents comprising an encoder for receiving and encoding document descriptions into encoded description information (Page 92, Section 2.2.3), wherein said data storage system is operative to store said encoded description information as said at least one description record (Page 93, Section 3.1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Dalziel et al and Nasar et al combination according to the teachings of Tuong Dao to include an encoder for receiving and encoding the image object descriptions into encoded description information because it will expedite retrieving the desired documents and will implement the process more securely.

Regarding Claim 17, arguments analogous to those presented for Claims 11 and 16 are applicable to Claim 17.

Regarding Claim 18, neither of Dalziel et al, Nasar et al and Tuong Dao disclose the system of claim 17, wherein said encoder comprises a binary encoder. Utilization of binary encoders are extremely well known in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a binary encoder for receiving and encoding the image object descriptions into encoded description information because it is the simplest and most conventional encoder routinely implemented in the art.

Regarding Claim 19, Tuong Dao further disclose the system of claim 17, wherein said encoder comprises an XML encoder (Page 88, Column 1, Lines 1-3).

With regards to Claims 35 and 52, arguments analogous to those presented for Claim 16 are applicable to Claims 35 and 52.

With regards to Claims 36 and 53, arguments analogous to those presented for Claim 17 are applicable to Claims 36 and 53.

With regards to Claims 37 and 54, arguments analogous to those presented for Claim 18 are applicable to Claims 37 and 54.

With regards to Claims 38 and 55, arguments analogous to those presented for Claim 19 are applicable to Claims 38 and 55.

With regards to Claims 58 and 60, arguments analogous to those presented for Claim 56 are applicable to Claims 58 and 60.

With regards to Claims 59 and 61, arguments analogous to those presented for Claim 57 are applicable to Claims 59 and 61.

NEW CITATIONS

NONE